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COTTON STRIPPER FOR HARVESTING RESEARCH PLOTS

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CURRENT SERIAL RECORDS

Scientists and engineers in cotton research are developing better equipment and methods to reduce the cost of producing cotton. Improvements are likewise needed in the research.

Specifically, there has been urgent need for a stripper-type plot harvester. Modifications have already been made to cottonpickers to harvest research plots.^{2/ 3/}

At the South Plains Research and Extension Center at Lubbock, Tex., approximately 5,000 plots are harvested each year either by hand or with a conventional cotton stripper. Because of limitations of time and labor, all plots cannot be harvested by hand. Plots can be harvested quicker and cheaper in a once-over operation with a simply modified, conventional stripper. However, such conversions do not provide the flexibility and convenience often needed in research work. An improved stripper-type plot harvester incorporating the needed features was designed and built in 1965 (fig. 1).

Description and Operation

The plot harvester, shown in figure 2, consists of a stripper head, a conveyance system, and a platform. The 2-row stripper head is a commercial, dual-roll model, with rolls of alternate brush and rubber strips.

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^{2/} Smith, H. P., and Brown, E. C., Jr. "Cotton picker sacking attachment for harvesting small plots." Agr. Engin. 34(4):234. April 1953.

^{3/} Clayton, J. E., Holston, J. T., Jr., and Wooten, O. B. "Two mechanical-picker attachments for harvesting cotton research plots." U.S. Agr. Res. Serv., ARS 42-85, 11pp. August 1963.



Figure 1. Cotton plot harvester in operation in the field. Small trailer provides a platform for obtaining and storing green bolls.

Figure 2. Cotton plot harvester and cotton trailer for harvesting when it is not necessary to sack all the cotton. Valves direct cotton either into the trailer or into the sacking attachment.



The conveyance system includes a belt conveyor, two radial flow fans, a green-boll separator, a vertical air separation chamber, and a sacking attachment. Air from the radial flow fans moves the cotton from the belt conveyor to the sacking attachment. The green-boll separator, which has been previously described by Kirk and Hudspeth,^{4/} removes green bolls from the stripped cotton. The air separation chamber allows the harvested cotton to drop into two 38- x 48-inch burlap bags.

^{4/} Kirk, I. W., and Hudspeth, E. B., Jr. "Development and testing of an improved green-boll separator for cotton stripper harvesters" Amer. Soc. Agr. Engin. Proc. 7(4):414-417. 1964.

Approximately 24 fifty-pound bags can be stored on the platform. A ladder on the front of the tractor provides convenient access to the platform. Figure 3 shows the platform, air separation chamber, and sacking attachment.



Figure 3. The air separation chamber and the sacking attachment are shown at the top of the picture. The platform is shown in the bottom portion. When in operation, one 38- x 48-inch burlap bag is attached to each side of the sacking attachment.

A four-man crew is used to operate the harvester: Two men on the platform to catch the samples; the tractor operator; and one man to sack the green bolls. If it is not necessary to catch green bolls, three men can operate the harvester.

The conveyance system is divided to keep the cotton harvested from each row separated. However, the cotton from both rows can be collected in the same bag or each row can be caught separately. Where cotton from both rows is being sacked together, a swinging gate valve allows the cotton to be directed into either bag. With this arrangement, the bags can be changed while the stripper is in operation, minimizing the time stopped between plots. Cotton from either or both rows can be directed into the trailer by positioning the gates in the elevators. These are controlled from the platform. This arrangement is particularly convenient where guard rows or buffer plantings are used.

About 60 two-row, 50-foot plots can be harvested per hour. In 1965, when both open-boll and stormproof varieties were harvested, field losses ranged from 0.89 to 5.79 percent.

Construction

Figures 4 through 7 show the construction details of the plot harvester. Fourteen-gage steel is used in the construction of the harvester except in the two sections of duct between the trailer (green-boll) discharge and air separation chamber where 16-gage galvanized sheet metal is used.

The 18-inch-wide conveyor belt is three-ply web belting running at 780 f.p.m.

The two straight-bladed radial flow fans are 13 inches in diameter, and turn at 2,100 r.p.m. to provide the required airflow for operation of the green-boll separator. A rear-mounted box on the duct system collects the green bolls as they are separated.

The grill on top of the air separation chamber (fig. 6) is made of 3/8-inch rods spaced 1/4-inch apart. This allows proper separation of bur cotton. A deflector in front of the grill directs trash and dirt away from men working on the platform.

The platform is made of 1/4- x 2- x 2-inch angle iron, decked with 3/4-inch exterior plywood. The sides around the platform are covered with reinforcing wire that has a 3- x 3-inch mesh. The platform is braced to the tractor by 1 1/4-inch pipe.

More details of construction for specific applications may be requested from the authors.

Summary

A two-row stripper-type plot harvester for cotton was designed and built at the South Plains Research and Extension Center in 1965. The cotton harvested from the plots can be kept separate according to rows, or both rows can be sacked together. Cotton from either or both rows can be diverted to a trailer pulled behind the harvester. Harvested samples from the plots are stored on a platform until they are unloaded at the end of the row. With this machine, research plots can be harvested quickly and efficiently regardless of field layout or test design.

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